



# Science Reporter

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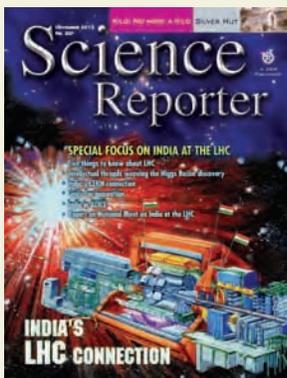
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Cover Picture : *Painting made by Pallavi Majumder, a student at the Government College of Art and Craft, Kolkata. This was presented to the then President of India Ms. Pratibha Patil on her visit to CERN in 2011. In the painting, Pallavi depicts the ALICE detector in the backdrop of the Big Bang.*

## ERA OF BIG SCIENCE

The era of Big Science dawned some time during the Second World War. Large-scale projects, usually to do research on weapons and war technology and mostly funded by national governments or groups of governments, were increasingly undertaken. These included the Manhattan Project to develop the world's first atomic bomb employing more than 130,000 people and the space race during the 1950s and 1960s.

In recent times, the International Space Station is one of the biggest Big Science projects ever launched with more than 20 space agencies collaborating. Similarly, the Human Genome Project to sequence the entire 3 billion chemical base pairs that make up the human DNA and identify all the estimated 20,000 to 25,000 genes that make up our genome was a mega project. The Hubble Space Telescope, the Super Kamiokande, the Superconducting Super Collider and most recently the Large Hadron Collider are other instances of widespread collaboration spread not just over countries but even continents.

Often such projects involve building of facilities that are indeed marvels of modern-day technology. The gigantic facilities push the technology frontiers to the extreme. They require 'big money' that comes from pooling financial resources and involves the coming together of the best brains in the world. Such mega projects hold out promises of solving or coming close to solving scientific mysteries that have eluded the scientific fraternity thus far. The intellectually challenging and exciting scientific ventures are a big source of motivation for young scientists too.

This issue of *Science Reporter* is devoted to one such mega science facility – the Large Hadron Collider – a multi-billion dollar facility whose scientific experiments have caught the fancy of one and all. Rarely in recent times has a scientific breakthrough made it to the screaming headlines of the front pages of newspapers worldwide. The coordination among scores of research laboratories spread all over the globe and participating in the LHC experiment is remarkable. Roughly 10,000 people are involved with the operations and experiments surrounding the Large Hadron Collider. There are 1800 physicists (including 400 students) participating from more than 176 institutions and laboratories in 38 countries.

In this issue we focus on the Indian contributions to this most exciting scientific experiment in recent times. In LHC, Indian groups have participated in a big way to produce international quality hardware, software and also provided skilled manpower support. Indian groups have also participated in experimental runs and physical analysis of the data.

In fact, the trigger for this issue was a National Meet on "India at the LHC" organised by the Indian National Science Academy recently. Once the idea for the issue had been planted, Vrishali Subramanian, ad-hoc scientist associated with *Science Reporter*, doggedly pursued some of the Indian groups that have participated in a big way in the LHC and had made exciting presentations at the National Meet.

We hope the issue that we have been able to put together not just unravels some of the complexities involved in the LHC experiment, but also highlights the Indian contribution and in the venture ends up motivating our young scientists of the future.

*Hasan Jawaid Khan*



International Space Station



Large Hadron Collider

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